GOES SXI Monthly Project Status Report

Lockheed Martin Advanced Technology Center
Month of October 2004

Mons Morrison, 18 November 2004

1 INTRODUCTION

The Lockheed Martin Space Systems Company Advanced Technology Center (LMATC) is developing three Solar X-ray Imager (SXI) instruments. Two are being built for flights on the National Oceanic and Atmospheric Administration's (NOAA) Geostationary Operational Environmental Satellites (GOES) N and O, and one as a flight spare. The SXI development is being managed by the NASA Goddard Space Flight Center. The SXI will image the full sun at wavelengths between approximately 6 and 60 Å with a detector having 5 arcsec pixels. The launch of the first SXI is planned for the GOES N with the launch of the second planned for GOES O.

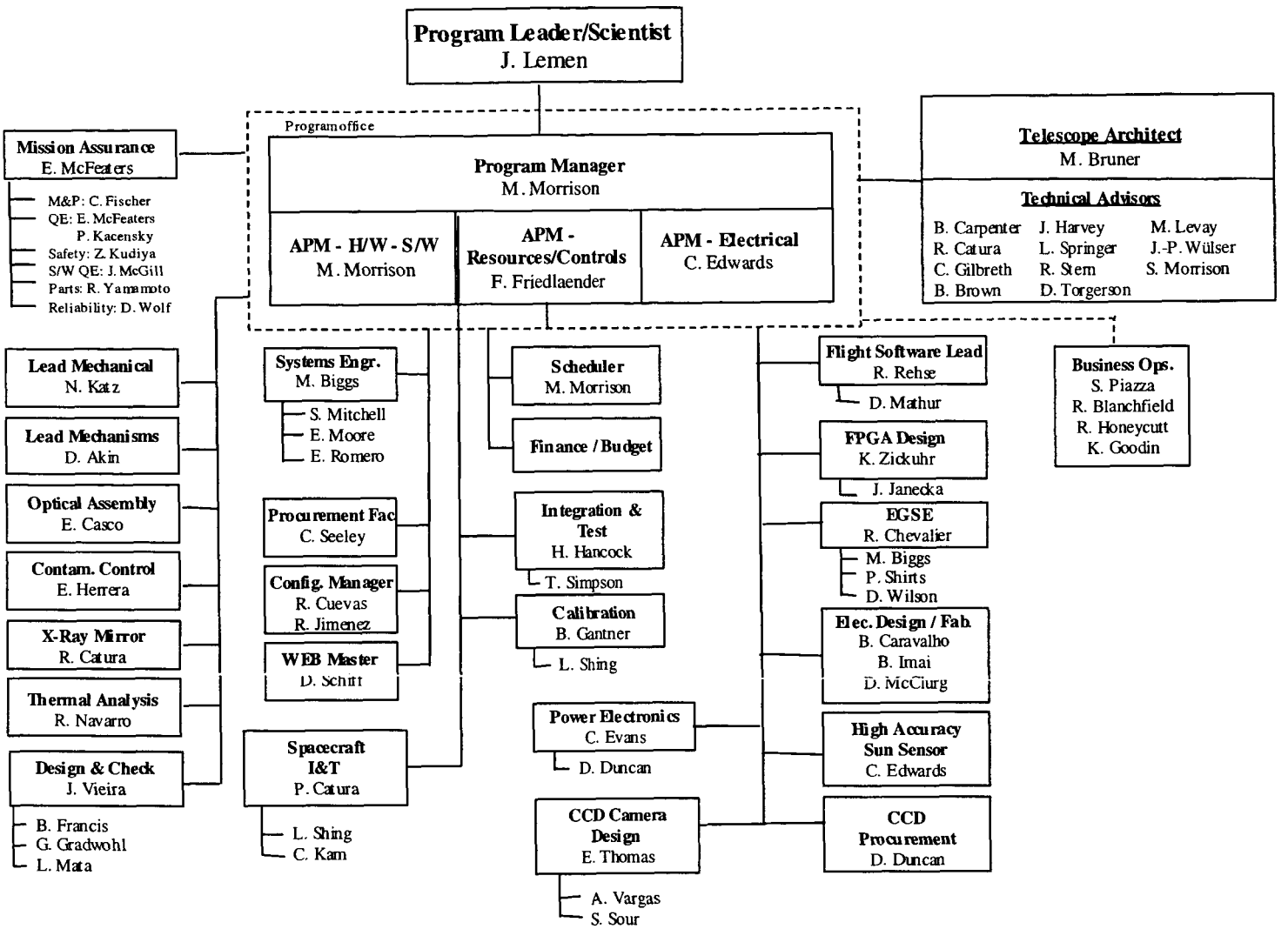
2 Summary

This report summarizes the status of the SXI program up to the date of this report. FM1/GOES-N support was on hold due to XRS removal. LM performed deployed solar array LFFT on 8-Nov, and the launch configuration LFFT on 12 Nov. FM2/GOES-O support included support for SCTV; testing currently in Cold 4. The spare instrument was delivered and DD250 signed on 29-Jun-04. The spare instrument is now in a 10K cleanroom under purge.

3 Programmatics

The oversight on the FM1/GOES-N, FM2/GOES-O, and spare instrument efforts has been smooth.

A copy of the organizational chart is shown below.



4 Accomplishments

4.1 Open Support Orders

Three support orders are currently active.

- Support Order #14 was opened to provide anomaly investigation support for the GOES-M SXI. The SOW has been sent to GSFC contracts. Mod 121 complete with GSFC and LM contracts offices. The final report is on hold.
- Support Order #15 was opened to add spacecraft PCM to the SXI Emulator stream. The completed emulator build was shipped to SEC and GSFC.
- Support Order #16 requested a document/pseudo-code Level-0&1 image product. The effort is underway.

4.2 Mirror status (Goodrich Space Systems, Danbury Optics Organization)

Goodrich Space Systems, Danbury Optics Organization continues its efforts on the flight model X-ray optics. The S/N 06 optic has been completed.

The S/N 06 mirror polishing, assembly, and environmental testing is complete. The mirror PSR occurred on 16-Sept and the mirror was delivered to LM on 29-Oct-04. It was inspected and placed in storage.

4.3 Interfaces with Boeing Satellite Systems

SXI contamination meetings have been held with BSS, GSFC, and LM input. A bagging/cleaning solution is being created for GOES-N/O/P. There are four open CCRs involving the spacecraft interface, CCR 8060 was submitted to update the harness drawing to show that the 10 wires need to be shorted to ground, CCR 8061 Waiver for FM1 stand-off plate vibration testing, CCR 8062 FM Spare serial number update, and CCR 8063 Ground database submission. All four CCRs are in the approval process.

4.4 Flight Model S/N 01

The FIST Long Form Functional Test (LFFT) was performed in 10K environment on 28-Jul-04. At that time, additional breaks were found in the OSR standoff plate, and dust contaminating a significant area of the plate. After discussions with GSFC, LM was given direction to replace the plate with a spare TV qualified plate. The cracked standoff plate 2A08719-101 L03 was replaced with standoff plate 2A08719-101 L05 after thermal cycling and pull test at LM (refer to Shop Order SXI04-6125 and SXI-04-6116). Meetings are being held to prevent contamination, and additional standoff plate damage. On 1 Nov, the front cover was adjusted for the alignment cube test. Shortly after, it was discovered that once again the front cover had been improperly opened. The deployed solar array LFFT was performed on 8 Nov, and the launch configuration LFFT was performed in 12 Nov. Both functional tests were nominal.

4.5 Flight Model S/N 02

The FM-2 SXI instrument is being tested with the GOES-O spacecraft. LM continues to support GOES-O integration and test efforts. Support for SCTV began on 3-Aug with TP319. LM is supporting 24/7 coverage during SCTV began with hard-vac on 21-Sept. A SFFT is performed at thermal vacuum cases 1-3, and a LFFT is performed at thermal vacuum cases Hot and Cold 4:

Hot1: 1-Oct

Cold1: 4-Oct

Hot2: 7-Oct

Cold2: 9-Oct

Hot3: 11-Oct

Cold3: 12-Oct

Hot4: 28-Oct

Cold4: 18-Nov

4.6 Flight Spare Model SXI

The spare flight model SXI was delivered on schedule on 29-Jun-04. The instrument is being stored in its shipping container (instrument bagged and placed inside two metal containers). It is under continuous GN2 purge. A six month functional test will be performed in early December.

4.7 SXI Emulator and Flight Software

Flight software build 5.27 was installed into FM1 and FM2 Nov 20/21-03.

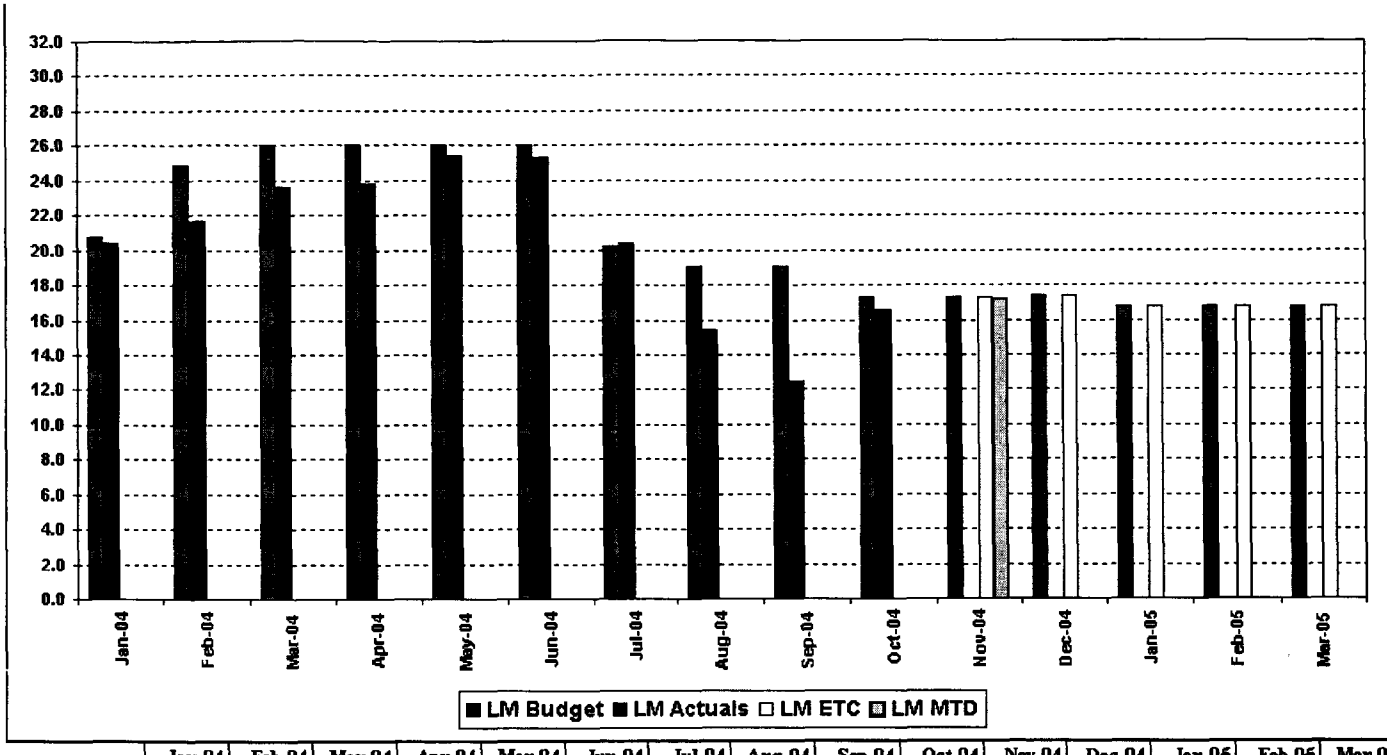
Modifications are being made to the emulator to incorporate the insertion of the PCM stream into the MDL telemetry (per Support Order #15). The initial coding is complete and functional testing has begun. Testing is being hampered by a lack of understanding of the MRS&S internal functionality, and a lack of support/responsiveness from ISI.

Mission Operations and Post-Launch Testing (PLT) dominate the technical exchanges with SEC and SOCC. Additional information was gathered for the new telemetry and command database submission to BSS from LMSAL. The additional telemetry points will allow for better configuration management in the telemetry stream processing at SEC. A weekly telecon is held with SEC and SOCC to work out remaining details for launch/operations.

LM supported the PLT rehearsal at the SOCC on 8-9 Nov. All critical tests were nominal.

5 Financial Management

The financial information is reported in the 533M, 533Q, and EVM reports. The planned and actual manpower requirements for direct labor are shown below.



	Jan-04	Feb-04	Mar-04	Apr-04	May-04	Jun-04	Jul-04	Aug-04	Sep-04	Oct-04	Nov-04	Dec-04	Jan-05	Feb-05	Mar-05
LM Budget	20.8	24.8	26.0	26.0	26.0	26.0	20.2	19.1	19.1	17.3	17.3	17.3	16.8	16.7	16.7
LM Actuals	20.4	21.7	23.6	23.8	25.4	25.3	20.4	15.4	12.5	16.6					
LM ETC											17.3	17.3	16.8	16.7	16.7
LM MTD											17.2				

Manpower Requirements for the SXI program

6 PLANNED ACTIVITIES

During the next reporting period, the planned activities include the following:

1. Support preparations for future GOES-N test activities. These include:
    - FIST activities
    - Launch and ops planning support
    - Support PSR
    - Perform Database update SFFT
2. Support preparations for future GOES-O test activities. These include:
    - Support Spacecraft Thermal Vacuum Ambient 2 testing
    - Retesting CEB 401 connector
    - Supporting RFA testing
3. Spare instrument
    - Monitor purge while in storage in the shipping container
    - 6 month storage functional test
    - Ship to BSS

7 Schedule Summary

SXI PROGRAM SCHEDULING METHOLOGY

The scheduling methodology for the SXI program is that all tasks are scheduled to start as early as possible. The program office uses the flexibility of early starts to adjust the schedule to accommodate resource and hardware limitations as required. Developing workarounds and rearranging activities for individual tasks maintain the overall program schedule.

SXI PROGRAM DELIVERY SCHEDULE SUMMARY

Engineering Model: Shipped 02 April 2001 (Returned to LM on 6 July 2001)
Flight Model 01: Shipped 13 November 2001.
Flight Model 02: Shipped 18 September 2002.
Spares Program: Shipped 29 June 2004 (Deliver to Storage)

Since the spare instrument has been delivered, there is no need to provide the MS Project schedules. The schedule from now on is determined by Boeing.

REPORT DOCUMENTATION PAGE

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13. ABSTRACT *(Maximum 200 words)*

The Lockheed Martin Missiles & Space Advanced Technology Center (LMATC) is developing three Solar X-ray Imager (SXI) instruments. Two will be built for flights on the National Oceanic and Atmospheric Administration's (NOAA) Geo-stationary Operational Environmental Satellites (GOES) N and O, and one will be a flight spare. The SXI development is being managed by the NASA Goddard Space Flight Center. The SXI will image the full sun at wavelengths between approximately 6 and 60 Å with a detector having 5 arcsec pixels. The launch of the first SXI will be on GOES N and the second SXI is to be launched on GOES O or P.

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